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(54) [Title of the Invention] Monocycle vehicle  
  
(57) [Abstract]

[Problem]

To provide a monocycle improving ride evaluation by stabilizing an attitude of a rider by reducing pivoting movement of the rider in adjusting an attitude of a vehicle body.

[Means for Resolution]

There are provided a vehicle body main body 2 provided with a saddle 3 at an upper portion thereof, a pivoting shaft 12 in a vehicle width direction mounted to the vehicle body main body 2, a support member 13 an upper portion of which is axially supported by the pivoting shaft 12, an axle 14 provided at a lower portion of the support member 13, a drive wheel 15 mounted to the axle 14, and pivoting means 7a, 10 for pivoting the support member 13 around the pivoting shaft 12 relative to the vehicle body main body 2.

[Claims]

[Claim 1]

A single axis wheel vehicle characterized in comprising:  
a vehicle body main body provided with a saddle at an upper portion thereof;

a pivoting shaft in a vehicle width direction mounted to the vehicle body main body;

a support member an upper portion of which is axially supported by the pivoting shaft;

an axle provided at a lower portion of the support member;

a drive wheel mounted to the axle; and

pivoting means for pivoting the support member around the pivoting shaft relative to the vehicle body main body.

[Claim 2]

The single shaft wheel vehicle according to Claim 1, characterized in that the lower portion of the support member for supporting the axle is pivotable around a vertical axis relative to the upper portion of the support member and is provided with subpivoting means for pivoting the lower portion of the support member around the vertical axis relative to the upper portion of the support member.

[Claim 3]

The single shaft wheel vehicle according to Claim 2, characterized in that a front portion of the vehicle body main body is provided with a handle comprising a handle post extended in a front and rear direction of the vehicle and a grip bar mounted to an end portion thereof, the grip bar is rotatable relative to the handle post substantially in a horizontal face around a shaft at a center portion thereof, and the subpivoting means is constituted by pivoting the lower portion of the support member relative to the upper portion of the support member around the vertical axis in accordance with an amount of rotating the grip bar around the shaft.

[Claim 4]

The single shaft wheel vehicle according to Claim 1, 2, or 3, characterized in that the front portion of the vehicle

body main body is provided with the handle comprising the handle post extended in the front and rear direction of the vehicle and the grip bar the center portion of which is axially supported by the end portion, an axis core of the grip bar is extended substantially in the vehicle width direction, grip portions at both end portions thereof are rotatable around the axis core, and the support member is pivoted around the pivoting shaft relative to the vehicle body main body in accordance with an amount of pivoting the grip portion around the axis core.

[Claim 5]

The single shaft wheel vehicle according to Claim 1, characterized in that the vehicle body main body includes a front frame projected to a front side of the drive wheel, a front end portion of the front frame is provided with a front wheel, an inclined seat is provided on a rear side of the saddle, and a steering rod is provided at a middle portion of the front frame.

[Claim 6]

The single shaft wheel vehicle according to any one of Claims 1 through 5, characterized in that a pedal shaft provided with a pedal for running by a pedaling force is mounted to the vehicle body main body by being offset from the axle of the drive wheel, and rotation of the pedal is transmitted to the drive wheel by way of power transmitting means.

[Detailed Description of the Invention]

[0001]

[Technical Field to which the Invention Belongs]

The present invention relates to a single axis wheel vehicle. The single axis wheel vehicle of the invention includes a monocycle and includes a vehicle which is provided with two wheels or more on the same axis core in parallel and in which a drive wheel is grounded on a road face by one point in view from a side face of the vehicle and a vehicle provided with an auxiliary wheel before or after the drive wheel and which runs mainly as a monocycle substantially in running.

[0002]

[Prior Art]

A monocycle having a pivoting reducing apparatus is disclosed in JP-A-9-175462. According to the monocycle described in the publication, a counter torque is applied opposedly to a direction of falling down the monocycle by a gyro and a self standing stability is promoted by reducing pivoting movement.

[0003]

[Problems that the Invention is to Solve]

However, according to the monocycle described in the publication, a force of returning an inclination of a vehicle body to a neutral position by a gyro moment by a flywheel of the gyro and therefore, a large moment is needed, the flywheel shape is enlarged, and a compact vehicle body shape cannot be provided.

[0004]

Further, in order to stabilize an attitude of the vehicle body, the vehicle body is pivotingly moved frontward and rearward and leftward and rightward centering on a ground point of the vehicle and therefore, a position of a rider is considerably pivotingly moved and deteriorates ride evaluation, in running by a pedal, the attitude is always rolled or pitched to be unstable, the pedal is difficult to be pedaled.

[0005]

The invention takes a consideration of the above-described prior arts and it is an object thereof to provide a monocycle improving ride evaluation by stabilizing an attitude of a rider by reducing a pivoting movement of the rider in adjusting an attitude of a vehicle body.

[0006]

[Means for Solving the Problems]

In order to achieve the above-described object, according to the invention, there is provided a single axis wheel vehicle characterized in comprising a vehicle body main body provided with a saddle at an upper portion thereof, a pivoting shaft in a vehicle width direction mounted to the vehicle body main body, a support member an upper portion of which is axially supported by the pivoting shaft, an axle provided at a lower portion of the support member, a drive wheel mounted to the axle, and pivoting means for pivoting the support member around the

pivoting shaft relative to the vehicle body main body.

[0007]

According to the constitution, the support member for supporting the drive wheel is pivoted around the pivoting shaft in the vehicle width direction relative to the vehicle main body having a seat (saddle) and therefore, a side of the drive wheel having a relatively small inertia efficiency can be pivoted in a front and rear direction while making the vehicle body main body stationary in the front and rear direction relative to the side of the vehicle body main body including the weight of a rider, and an attitude of the rider riding on the saddle is stably maintained. Thereby, ride evaluation is promoted, also driving operation is facilitated, and running can be enjoyed easily by a riding feeling similar to that of a normal pedal driving bicycle.

[0008]

A preferable constitution example is characterized in that the lower portion of the support member for supporting the axle is pivotable around a vertical axis relative to the upper portion of the support member and is provided with subpivoting means for pivoting the lower portion of the support member around the vertical axis relative to the upper portion of the support member.

[0009]

According to the constitution, by the subpivoting means,

the lower portion of the support member for supporting the drive wheel is pivoted around the vertical axis relative to the vehicle main body having the saddle and therefore, the side of the drive wheel having the relatively small inertia efficiency can be pivoted in a left and right direction while making the vehicle main body stationary in the left and right direction relative to the side of the vehicle body main body including the weight of the rider, and adjusting operation against falldown to the left and to the right can be carried out in a state of stably maintaining the attitude of the rider riding on the saddle.

[0010]

In this case, a distance from an inertia center of a total of the vehicle body including the rider to a point of grounding the wheel constituting a point of operating a force from a transverse direction to the total of the main body is increased and therefore, a large moment can be generated by a small force and a function of controlling the attitude is promoted.

[0011]

A further preferable constitution example is characterized in that a front portion of the vehicle body main body is provided with a handle comprising a handle post extended in a front and rear direction of the vehicle and a grip bar mounted to an end portion thereof, the grip bar is rotatable relative to the handle post substantially in a horizontal face



around a shaft at a center portion thereof, and the subpivoting means is constituted by pivoting the lower portion of the support member relative to the upper portion of the support member around the vertical axis in accordance with an amount of rotating the grip bar around the shaft.

[0012]

According to the constitution, by pivoting the grip bar of the handle in the left and right direction in the horizontal face around the shaft of the center portion, the vehicle can be driven by maintaining a balance by a steering feeling similar to that of a normal pedal driving bicycle and running can be enjoyed by learning the operation easily.

[0013]

A further preferable constitution example is characterized in that the front portion of the vehicle body main body is provided with the handle comprising the handle post extended in the front and rear direction of the vehicle and the grip bar the center portion of which is axially supported by the end portion, an axis core of the grip bar is extended substantially in the vehicle width direction, grip portions at both end portions thereof are rotatable around the axis core, and the support member is pivoted around the pivoting shaft relative to the vehicle body main body in accordance with an amount of pivoting the grip portion around the axis core.

[0014]

According to the constitution, a gripping portion (grip) of the handle can be pivoted around the axis core, a rider can adjust the balance while making the attitude stable by pivoting the drive wheel in the front and rear direction relative to the vehicle body main body by only moving the wrist gripping the gripping portion and the operability is improved.

[0015]

A further preferable constitution example is characterized in that the vehicle body main body includes a front frame projected to a front side of the drive wheel, a front end portion of the front frame is provided with a front wheel, an inclined seat is provided on a rear side of the saddle, and a steering rod is provided at a middle portion of the front frame.

[0016]

According to the constitution, in starting to run the vehicle, running is started in a stable state by grounding both of the front and rear wheels by moving the weight of the rider to the front side, after shifting to steady-state running, by putting the body weight to the inclining seat, a gravitational center of the vehicle body including the rider is shifted rearward from a point of grounding the drive wheel (rear wheel) and the vehicle can be run in a state of floating up the front wheel from the running road face. Thereby, shifting to the steady-state running is easily and smoothly carried from starting to run the vehicle and driving having a floated feeling

can be enjoyed. Further, by operating the steering rod provided at the middle portion of the front frame supporting the front wheel, the balance in the front and rear direction and in the left and right direction of the vehicle can be adjusted by stabilizing the position of the gravitational center while leaning on the inclining seat and the operability is promoted.

[0017]

A further preferable constitution example is characterized in that a pedal shaft provided with a pedal for running by a pedaling force is mounted to the vehicle body main body by being offset from the axle of the drive wheel, and rotation of the pedal is transmitted to the drive wheel by way of power transmitting means.

[0018]

According to the above-described constitution, the pedal shaft is provided to the vehicle body main body at a separate position by being offset from the axle of the drive wheel and therefore, the position relative to the saddle becomes always constant and the rider riding on the seat can pedal the pedal in a stable attitude.

[Means for Solving the Problems]

[0019]

[Mode for Carrying out the Invention]

An explanation will be given of an embodiment of the invention in reference to the drawings as follows. Fig.1 is

an outlook view of a monocycle according to the embodiment of the invention. The monocycle 1 is provided with a saddle 3 at an upper portion of a vehicle body main body 2. The saddle 3 is mounted to an upper portion of a saddle post 4 a height of which can be adjusted as shown an arrow mark A relative to the vehicle body main body 2. An end portion of the saddle post 4 is provided with a handle 4a for carrying or the like.

[0020]

A handle 5 is projected to be mounted at a front portion of the vehicle body main body 2. The handle 5 is formed in a T-like shape by a handle post 6 extended in a front and rear direction of the vehicle body and a grip bar 7 a center portion of which is axially supported by a front end thereof. According to the handle post 6, a shaft portion 6a of a root portion thereof is mounted pivotably to the vehicle body main body 2, and in containing the handle 5, the handle post 6 can be constituted by a compact shape by pivoting the handle post 6 in an upward direction (in a saddle post direction) as shown by an arrow mark B. The handle 5 can be fixed to be held at a using position projecting the handle 5 in a front direction of the vehicle body main body 2 and a containing position pivoting the handle 5 in an upward direction by pertinent locking means.

[0021]

The grip bar 7 is extended substantially in a vehicle width direction (left and right direction) and can be pivoted around

a shaft 8 at a center portion thereof as shown by an arrow mark C. Pivoting motion in a left and right direction indicated by the arrow mark C is transmitted to a side of a support portion of the drive wheel of the vehicle body main body by way of a wire, not illustrated, trim adjustment is carried out by the pivoting movement as mentioned below, and rolling of the vehicle body is corrected. Numeral 9 designates a brake lever.

[0022]

Grip portions (grip) 7a of the grip bar 7 can be pivoted around an axis core in the left and right direction as shown by arrow mark D. The pivoting motion around the arrow mark D is transmitted to the side of the support portion of the drive wheel of the vehicle body main body by way of a cable 10 of a push pull type to pivotingly move the drive wheel in a front and rear direction as mentioned below.

[0023]

The respective left and right grips 7a are provided with levers 11 for driving a gyro apparatus, mentioned later. The lever 11 can be operated lightly by the finger in the left and right direction as shown by an arrow mark E, thereby, orientation (yawing) is adjusted by driving the gyro apparatus as mentioned later.

[0024]

Inside of the vehicle body main body 2 is provided with a support member 13 an upper end portion of which is axially

supported by a pivoting shaft 12. An axle 14 is mounted at a lower end portion of the support shaft 13 and a drive wheel 15 is mounted to the axle 14. A sprocket 16 for driving the wheel is mounted coaxially with the pivoting shaft 12. The sprocket 16 is connected to a sprocket 14a mounted to the axle 14 by way of a chain 17.

[0025]

Left and right side faces of the vehicle body main body 2 are respectively provided with pedal shafts 18 at positions offset from the axle 14 and mounted with pedals 19. The pedal shaft 18 is mounted with a pedal sprocket 18a which is connected to a sprocket 21 coaxial with the pivoting shaft 12 by way of a chain 20. Thereby, a pedaling force is transmitted to the sprocket 21 coaxial with the pivoting shaft 12 by way of the chain 20 to rotate the sprocket 16 coaxial therewith. Rotation of the sprocket 16 is transmitted to the sprocket 14a of the axle 14 by way of the chain 17 to rotate the drive wheel 15.

[0026]

By providing the pedal shaft 18 and the axle 14 at separate positions offset from each other without constituting a directly connecting structure in this way, even when the axle 14 is pivotingly moved in the front and rear direction relative to the vehicle body main body 2 as mentioned later, the pedal shaft 18 is maintained always at a constant position relative to the vehicle body main body 2 and therefore, a rider can ride

thereon by a stable attitude.

[0027]

Further, by the offset shaft structure, a one way clutch can be mounted, for example, at the pedal shaft 18 or the pivoting shaft 12 or the axle 14 in a pedaling force transmitting system from the pedal shaft 18 to the axle 14, thereby, running by inertia can be carried out while stopping to rotate the pedals, running with a speed feeling can be enjoyed by easy driving.

[0028]

Inside of the vehicle body main body 2 is provided with a gyro apparatus 22 having a flywheel rotated around a rotating shaft in the vehicle width direction. According to the gyro apparatus 22, by inclining the levers 11 provided at the grips 7a of the handle 5 to the left and to the right, the rotating shaft of the flywheel is pivoted in a vertical face in accordance with an amount of the inclination. Thereby, the orientation (yawing) of the vehicle body is adjusted. In this case, since the levers 11 are provided at the both end portions of the grip bar 7 and therefore, the levers 11 can easily be operated while gripping the grips 7a.

[0029]

Fig.2 is a side view showing a state of running the monocycle according to the invention. A root portion of the handle post 6 is provided with a light 23. A generator (not illustrated) is provided for lighting the light 23. Further,

an electricity charging type battery (not illustrated) may be provided along with the generator. A basket 24 for a load is attached to a lower side of the saddle 3 at an upper portion of a rear side of the vehicle body. As described above, the pedal shaft 18 is provided to be offset from the axle 14 of the drive wheel 15 and therefore, even when the axle 14 is pivoted frontward and rearward relative to the vehicle body main body 2, the rider riding on the saddle 3 can maintain a stable attitude in a state of gripping the handle bar 7.

[0030]

Fig.3 is a detailed view of a portion of the pivoting shaft 12 of the support member 13. The support member 13 for supporting the drive wheel 15 (Fig.1) is divided into a vehicle body axially attaching portion side 13a at an upper portion thereof and a wheel holding portion side 13b on a lower side thereof. The vehicle body axially attaching portion side 13a of the upper portion is mounted to the pivoting shaft 12 horizontally provided in the vehicle width direction (left and right direction) of the vehicle body main body 2 (Fig.1) pivotably as shown by an arrow mark G. Relative to the vehicle body axially attaching portion side 13a, the wheel holding portion side 13b on the lower side can be rotated as shown by an arrow mark J around a vertical axis orthogonal to a horizontal dividing face (not illustrated) thereof.

[0031]



The above-described cable 10 (Fig.1) of the push pull type is attached to the vehicle body main body 2 by way of a bracket 25 and a holding piece 26, and an end portion thereof is connected to the vehicle body axially attaching portion side 13a at the upper portion of the support member 13 by way of a connecting piece 31.

[0032]

In such a constitution, by pivoting the above-described grips 7a of the handle bar 7 shown in Fig.1, as shown by the arrow mark D (Fig.1), an end portion of the cable 10 is moved in the front and rear direction as shown by an arrow mark F in corporation therewith, and the vehicle body axially attaching portion side 13a is pivoted around the pivoting shaft 12 as shown by the arrow mark G. By the pivoting means, a total of the support member 13 is pivoted around the pivoting shaft 12 to pivot the drive wheel 15 at a lower portion in the front and rear direction relative to the vehicle body main body 2.

[0033]

In addition to the pivoting means, according to the embodiment, as sub pivoting means, a wire 27 of a push pull type is arranged from the handle bar 7 similar to the cable 10. The wire 27 is for transmitting rotational motion of the arrow mark C (Fig.1) around the shaft 8 at the center portion of the handle bar 7 and held by a holding piece 28 mounted to the holding piece 26 of the cable 10 and an attaching piece 29 provided at an upper

portion side of the support member 13, and a connecting ring 30 at an end portion thereof is connected to an upper end portion of the wheel holding portion side 13b of the lower portion side of the support member 13.

[0034]

When the handle 7 is pivoted as shown by the arrow mark C (Fig.1), the wire 27 is operated in a front and rear direction as shown by an arrow mark H (Fig.3) in corporation therewith to rotate the wheel holding portion side 13b of the lower portion side of the support member 13 in a horizontal face relative to the vehicle body axially attaching portion side 13a of the upper portion side as shown by the arrow mark J. Thereby, the drive wheel 15 is pivoted to change the direction in the left and right direction relative to the vehicle body main body 2. Thereby, when the vehicle body is going to be fallen down, a moment of a transverse side for recovering the falldown can be operated by changing the direction in the left and right direction of the drive wheel 15 while maintaining the direction of the vehicle body main body in the front direction and rolling can be adjusted.

[0035]

Fig.4 is a perspective view of an essential portion of other embodiment of the invention. The embodiment uses a hydraulic or pneumatic cylinder 32 in place of the above-described cable 10 of Fig.3 as pivoting means for pivoting

the drive wheel 15 in the front and rear direction by pivoting the support member 13 around the pivoting shaft 12. The cylinder 32 is connected to the vehicle body axially attaching portion side 13a at the upper portion of the support member 13 by way of the connecting piece 31. Similar to the case of the cable 10, an amount of driving the cylinder 32 as shown by the arrow mark F (Fig.4) in accordance with the rotational motion (arrow mark D) around the axis core of the handle grip 7a (Fig.1) is changed. Thereby, in accordance with the amount of operating the grip 7a, the support member 13 can be pivoted around the pivoting shaft 12 as shown by the arrow mark G. Other constitution and operation and effect are similar to those of the above-described embodiment of Fig.3.

[0036]

Fig.5 is a perspective view of an essential portion of still other embodiment of the invention. The embodiment is provided with a generator 33 for generating electricity by pedal driving at the upper portion side of the supporting member 13, and the wheel is driven by rotating a motor (not illustrated) integrated to the wheel by the generator 33 and an electricity charging type battery (not illustrated). Therefore, the sprocket 16 and the chain 17 for transmitting the pedaling force to the axle as shown by Fig.3, Fig.4 are not provided. The other constitution and operation and effect are similar to those of the above-described embodiment of Fig.4.

[0037]

Fig.6 is a perspective view of an essential portion of still other embodiment of the invention. According to the embodiment, the invention is applied to a power assisting vehicle. As described above, the vehicle body axially attaching portion side 13a at the upper portion of the support member for supporting the drive wheel is axially supported by the pivoting shaft 12. Although not illustrated, the wheel holding portion side 13b rotatable around the vertical axis relative to the vehicle body axially attaching portion side 13a is connected to the vehicle body axially attaching portion side 13a at the lower position proximate to the axle similar to the above-described respective embodiments. The pedaling force is transmitted to the axle side by way of the chain 20, the sprockets 11, 16 and the chain 17. The pedaling force is combined with a drive force of a motor (not illustrated) by a predetermined assist ratio in accordance with a vehicle speed by a combining apparatus (not illustrated). By rotating the axle by a combining force combined with the pedaling force and the motor drive force in this way, the pedaling force is assisted by the motor under a predetermined condition to alleviate a pedaling load.

[0038]

Fig.7 is a constitution view of the motor used in the power assisting vehicle of Fig.6. The motor 34 is constituted by a

first motor portion 35 formed coaxially with an axle C and a second motor portion 36 at an outer periphery thereof. The first motor portion 35 is constituted by a stator 37 fixed to a casing 36, an iron core 38 fixed to an inner peripheral side of the stator 37, a coil 39 wound around the iron core 38, a rotor (permanent magnet) 40 provided on an outer peripheral side of an axle drum 47 opposedly to the iron core 38. The axle drum 47 is rotatably mounted to the stator 37 by way of a bearing 41.

[0039]

The second motor portion 36 is constituted by an iron core 42 fixed to an outer peripheral side of the stator 37, a coil 43 wound around the iron core 42, a flywheel 45 rotatably mounted to the stator 37 by way of a bearing 44, a rotor (permanent magnet) 46 provided at an inner peripheral side of the flywheel 45 opposedly to the iron core 42.

[0040]

Inside of the axle drum 47 is mounted with a transmission 48. The transmission 48 is connected to a sprocket 50 engaged with the above-described chain 17 for transmitting the pedaling force by way of a one way clutch 49. A brake drum 51 is mounted on the axle C on an outer side of the sprocket 50.

[0041]

As described above, the support member 13 (Fig.3, Fig.4, Fig.5) for supporting the wheel is divided into the vehicle body

axially attaching portion side 13a at the upper portion and the wheel holding portion side 13b at the lower portion rotatable around the vertical axis relative to the upper portion. Numeral 52 designates a position of a bearing provided at the dividing face.

[0042]

Fig.8 is a side view of still other embodiment of the invention. According to the invention, an upper portion of a vehicle body main body 53 is provided with a reclining seat 55 integral with a saddle 54. The reclining seat 55 may be separate from the saddle 54. A pair of left and right front frames 50 are integrally projected from a front portion of the vehicle body main body 53. A front wheel 60 is mounted to end portions of the front frames 56. A pedal 58 is mounted to an axle 60a of the front wheel 60. The pedaling force is mounted to the sprocket 14a on the axle of the drive wheel 15 by way of a chain 59 and by way of the sprockets 21, 16 coaxial with the pivoting shaft 12 provided at the vehicle body main body 53 and the chain 17 similar to the above-described embodiments to drive to rotate the drive wheel 15.

[0043]

The vehicle body main body 53 is mounted with the upper vehicle body axially attaching portion side 13a rotatable around the pivoting shaft 12 and mounted with the wheel holding portion side 13b pivotable around the vertical axis relative

to the upper portion vehicle body axially attaching portion side 13a at the lower portion similar to the above-described respective embodiments.

[0044]

A steering rod 57 is provided at a middle portion of one of the left and right front frames 56. The steering rod 57 is inclinable freely in the front and rear direction and in the left and right direction, and a grip 57a thereof is rotatable around an axis core thereof. The drive wheel 15 is pivoted in the front and rear direction relative to the vehicle body main body 53 by pivoting the support member 13 around the pivoting shaft 12 by way of a cable, not illustrated, (in correspondence with the cable 10 of the above-described embodiments) by an amount of inclining the steering rod 57 in the front and rear direction. Further, trimming (rolling) is adjusted by pivoting the wheel holding portion side 13b of the lower portion of the support member around the vertical axis relative to the vehicle body axially attaching portion side 13a at the upper portion by way of a wire, not illustrated, (in correspondence with the wire 27 of the above-described embodiments) by an amount of inclining the steering rod 57 in the left and right direction. Further, orientation (yawing) of the vehicle body is adjusted by pivoting the rotating shaft of the gyro apparatus 22 in the vertical face by rotating the grip 57a around the axis core in accordance with an amount of rotating the grip 57a.

[0045]

According to the embodiment of Fig.8, in starting to run the vehicle, running is started in a stable state by grounding the front wheel 160 by shifting the body weight of the rider to a front side, after shifting to steady-state running, by putting the body weight on the reclining seat 55, the vehicle can be run in a state of floating up the front wheel 60 from a running road face R by shifting a gravitational center of the vehicle body including the rider rearward from a point of grounding the drive wheel 15. Thereby, shifting to the steady-state running can smoothly and easily be carried out from starting to run the vehicle and driving having a floating feeling can be enjoyed. Further, by operating the steering rod 57 provided at the middle portion of the front frame 56 supporting the front wheel 60, the balance in the front and rear direction and in the left and right direction of the vehicle body can be adjusted in a state of stably holding the attitude while leaning on the reclining seat 55 and the operability is promoted.

[0046]

Fig.9 is a perspective view of an essential portion of the embodiment of Fig.8. The constitution is similar to that of the above-described embodiment of Fig.5, provided with the generator 33 for generating electricity by pedal driving on the upper portion side of the support member 13 and drives the wheel



by rotating a motor (not illustrated) integrated to the wheel by the generator 33 and an electricity charging type battery (not illustrated). In this case, a chain 59 for transmitting the pedaling force is arranged to be directed in the front direction.

[0047]

Fig.10 is a perspective view of a total of still other embodiment of the invention. According to the embodiment, a carrier 64 is connected to a rear side of the above-described monocycle 1 shown in Fig.1. The carrier 64 is provided with two left and right wheels 64a, 64b, and mounted with a solar cell panel 65 having, for example, an automatic directivity. The carrier 64 is connected to a connector 61 provided at a rear portion of the vehicle main body 2 of the monocycle 1 rotatably around a horizontal shaft 62 as shown by an arrow mark P and rotatably around a vertical shaft 63 as shown by arrow mark Q. Thereby, running of the monocycle can be enjoyed without considerably changing a driving feeling of the above-described monocycle 1. In this case, the wheel 15 is restricted from being pivotingly moved in the front and rear direction to be stabilized and therefore, the vehicle can stably run by being facilitated to balance in the front and rear direction.

[0048]

As other embodiment of the invention, in place of connecting the carrier of Fig.10, by connecting two or more of

the above-described monocycles of Fig.1 in an advancing direction (connecting the vehicle body main bodies), a plurality of persons can simultaneously enjoy running. In this case, the carrier can be connected thereto as in the embodiment of Fig.10.

[0049]

[Advantage of the Invention]

As has been explained above, according to the invention, the support member for supporting the drive wheel is pivoted around the pivoting shaft in the vehicle width direction relative to the vehicle body main body having the seat (saddle 9 and therefore, the drive wheel side having a relatively small inertia efficiency can be pivoted in the front and rear direction while making the vehicle body main body stationary in the front and rear direction relative to the vehicle body main body side including the weight of the rider, and the attitude of the rider riding on the saddle can stably be maintained. Thereby, the ride evaluation is promoted, driving operation is facilitated and running can be enjoyed by a riding feeling similar to that of a normal pedal driving bicycle.

[Brief Description of the Drawings]

[Fig.1]

Fig.1 is a perspective view of a total of an embodiment of the invention.

[Fig.2]

Fig.2 is a side view of a state of using the embodiment of the invention.

[Fig.3]

Fig.3 is a perspective view of an essential portion of the embodiment of the invention.

[Fig.4]

Fig.4 is a perspective view of an essential portion of other embodiment of the invention.

[Fig.5]

Fig.5 is a perspective view of an essential portion of still other embodiment of the invention.

[Fig.6]

Fig.6 is a perspective view of an essential portion of still other embodiment of the invention.

[Fig.7]

Fig.7 is a constitution view of a motor of the embodiment of Fig.6.

[Fig.8]

Fig.8 is a side view of still other embodiment of the invention.

[Fig.9]

Fig.9 is a perspective view of an essential portion of the embodiment of Fig.8.

[Fig.10]

Fig.10 is a perspective of a total of still other

embodiment of the invention.

[Description of Numerals and Signs]

1: monocycle, 2: vehicle body main body, 3: saddle, 4: saddle post, 5: handle, 6: handle post, 7: handle bar, 7a: grip, 8: shaft, 9: brake lever, 10: cable, 11: lever, 12: pivoting shaft, 13: support member, 13a: vehicle body axially attaching portion side, 13b: wheel holding portion side, 14: axle, 14a: sprocket, 15: drive wheel, 16: sprocket, 17: chain, 18: pedal shaft, 18a: sprocket, 19: pedal, 20: chain, 21: sprocket, 22: gyro apparatus, 23: light, 24: basket, 25: bracket, 26: holding piece, 27: wire, 28: holding piece, 29: attaching piece, 30: connecting ring, 31: connecting piece, 32: cylinder, 33 generator, 34: motor, 35: first motor portion, 36: second motor portion, 37: stator, 38: iron core, 39: coil, 40: rotor, 41: bearing, 42: iron core, 43: coil, 44: bearing, 45: flywheel, 46: rotor, 47: axle drum, 48: transmission, 49: one way clutch, 50: sprocket, 51: brake drum, 52: line of bearing of dividing face, 53: vehicle body main body, 54: saddle, 55: reclining seat, 56: front frame, 57: steering rod, 58: pedal, 59: chain, 60: front wheel, 60a: axle, 61:connector, 62: horizontal shaft, 63: vertical shaft, 64: carrier, 65: solar cell panel

Fig.2

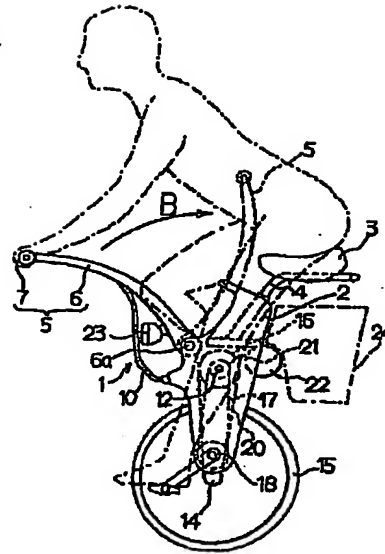


Fig. 4

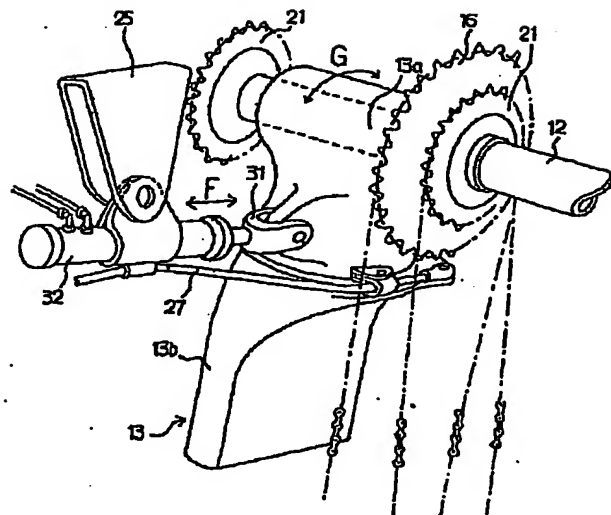


Fig.5

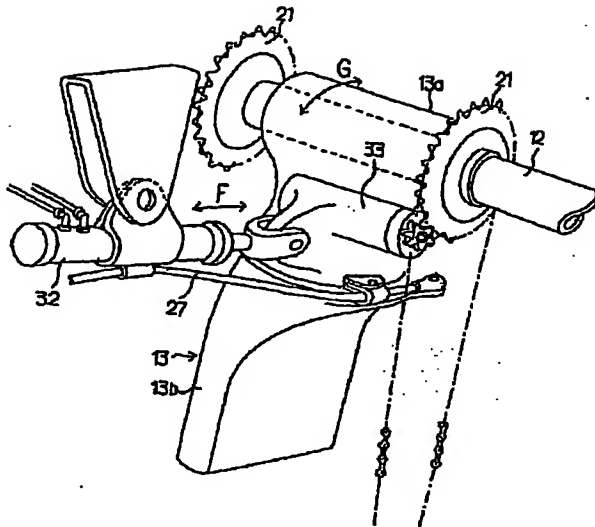


Fig.6

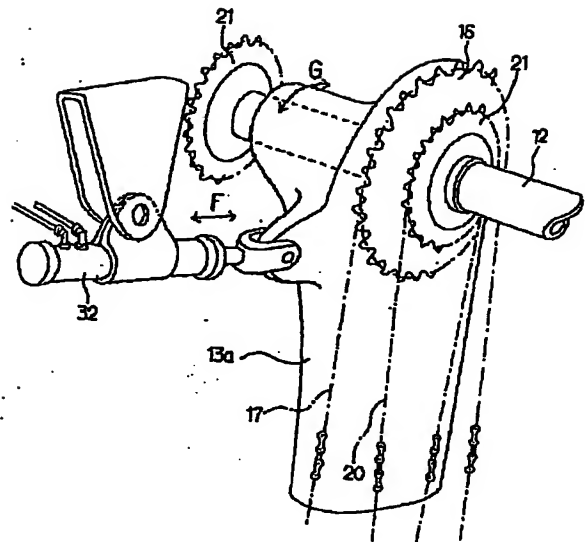


Fig.7

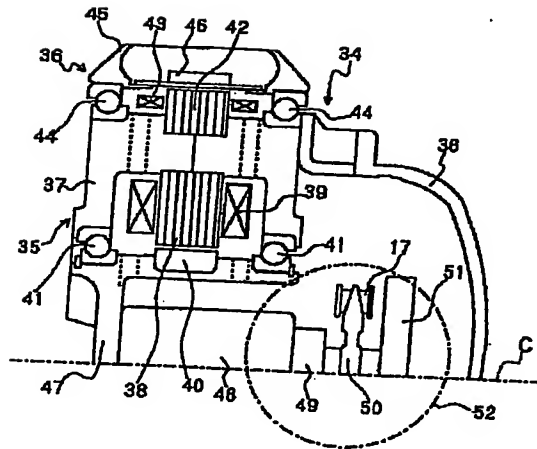
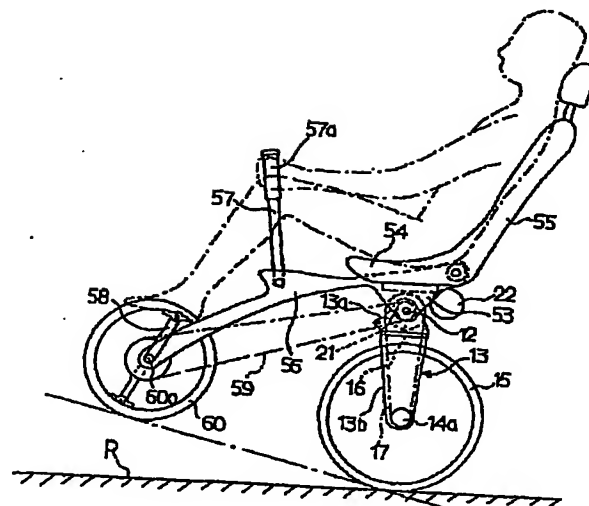


Fig.8





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